Australian Government
Australian Transport Safety Bureau

Collision with terrain involving Robinson Helicopter Company R44, VH-TKI

Forresters Beach, New South Wales on 19 November 2022

ATSB Transport Safety Report
Aviation Occurrence Investigation (Short)
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Addendum

Page	Change	Date

Executive summary

What happened

On 19 November 2022, the pilot of a Robinson Helicopter Company R44, registered VH-TKI, was conducting a private flight from a nearby property to a function centre at Forresters Beach, New South Wales with 2 passengers onboard. The proposed landing site was the carpark of the venue. During the approach, the pilot reported an uncommanded yaw to the right which was unable to be recovered. Following a loss of control, the helicopter struck powerlines before colliding with terrain. The occupants received minor injuries and the helicopter sustained substantial damage.

What the ATSB found

The ATSB found that during approach to a confined area landing site, the helicopter experienced a loss of tail rotor effectiveness and accompanying right yaw. The pilot's response was ineffective at recovering control, however, with the position of the aircraft on approach to the confined area it could not be established if the control of the aircraft could have been recovered before the helicopter collided with powerlines and terrain.

Safety message

Helicopter pilots should remain cognisant of the factors that may induce unanticipated yaw, especially the relative wind direction, and either avoid or manage their influence on the helicopter's anti-torque system by maintaining positive control of the yaw rate. If unanticipated yaw is encountered, prompt and correct pilot response is essential. Depending on the yaw rate recovery may not be immediate, but maintaining the recovery control inputs is the most effective way to stop the yaw.

A prompt response is especially important for confined area operations where the physical characteristics of the landing site may limit the options available to the pilot in the event of an unanticipated yaw or emergency landing.

The investigation

Decisions regarding the scope of an investigation are based on many factors, including the level of safety benefit likely to be obtained from an investigation and the associated resources required. For this occurrence, a limited-scope investigation was conducted in order to produce a short investigation report, and allow for greater industry awareness of findings that affect safety and potential learning opportunities.

The occurrence

On 19 November 2022, the pilot of a Robinson Helicopter R44, registered VH-TKI, was conducting a private flight to take 2 passengers from a nearby property to a function centre at Forresters Beach, New South Wales (Figure 2).

At about 1800 local time, the pilot commenced the first of 2 approaches to the proposed landing site, located in the carpark of the function centre. The pilot reported that the approach was towards the north-east, with the wind coming from 10º to the left of the nose and that all indications were normal.

After experiencing instability in the hover over the landing area, the pilot elected to conduct a missed approach (see Video 1). During the second approach, as the helicopter slowed to an airspeed of approximately 20 kt and approached the tree line at approximately 100 ft above ground level, the pilot reported the helicopter began an uncommanded yaw to the right that could not be corrected with full left pedal input.

Recognising the helicopter’s proximity to the people gathered at the venue and in the street below, the pilot attempted to manoeuvre the helicopter away from the landing site towards a clearing on the opposite side of the road. However, the rate of rotation increased, with the helicopter making two and a half revolutions before striking powerlines and colliding with terrain. The pilot and both passengers sustained minor injuries and the helicopter was substantially damaged (Figure 1).

Figure 1: Accident site

Source: ATSB

Context

Pilot information

The pilot held a valid commercial pilot license (helicopter) with a class 2 medical certificate.

At the time of the accident, the pilot had about 190 hours of aeronautical experience, with most of this experience in the R44. Since obtaining their license in 2016, they had accrued approximately 90 hours of flying. The pilot also completed a low-level rating in an R44 on 1 October 2022. This operational rating also counted as a flight review.

The low-level rating included low-level emergencies and autorotations,[1] however, unanticipated yaw, (see the section titled *Unanticipated yaw*) was not covered. The pilot did recall receiving classroom-based training in relation to the recognition of the onset of loss of tail rotor effectiveness (LTE) during their license training and recalled conducting loss of tail rotor emergency training as part of a previous flight review.

Helicopter information

The R44 is a 4-place helicopter that is primarily all metal construction with a 2-blade main and tail rotor system powered by a 6-cylinder Lycoming piston engine. VH-TKI was manufactured in the United States in 1994 and issued serial number 0040. It was registered in Australia in 2021. The helicopter was maintained in accordance with the manufacturer's maintenance schedule, which

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1 Autorotation: Autorotation is a condition of descending flight where, following engine failure or deliberate disengagement, the rotor blades are driven solely by aerodynamic forces resulting from rate of descent airflow through the rotor. The rate of descent is determined mainly by airspeed.

required a periodic inspection every 100 hours or 12 months, whichever came first. The maintenance release indicated that VH-TKI had accumulated a total of 1,582.9 hours in service at the time of the occurrence.

The helicopter had flown 3.8 hours since the last periodic inspection, and no outstanding defects were noted in the maintenance release. The helicopter was within the weight-and-balance and centre-of-gravity limits. The co-pilot controls had been removed and were stored under the pilot's seat for the flight.

Weather

The pilot advised that as part of their pre-flight planning, they had obtained the weather forecast and prior to departure continued to monitor the observations, at Williamtown Aerodrome, located about 75 km to the north-north-east of the landing site. Williamtown was the closest aerodrome on the coast with briefing and NOTAM[2] services available.

The weather forecast for Williamtown indicated the conditions expected for the planned time of arrival would be CAVOK[3] with winds from the north-east at 12 kt. Conditions throughout the flight were reportedly as forecast and provided smooth flying conditions.

The nearest Bureau of Meteorology weather observation site was located at Gosford, 10 km south-south-west of the landing site. Weather data recorded at about the time of the occurrence showed the wind from the north-east at 6–10 kt.

The ATSB received video footage of both approaches (see video 1 and 2) which showed the palm trees at the edge of the landing area moving in the wind. The pilot advised that flags positioned by the road at the front of the venue were used to ascertain the local wind direction. Eye-witness reports did not provide a clear indication of the wind speed, but confirmed the wind was coming from the north-east.

The approaches

The Robinson R44 Pilots Operating Handbook stated that in-ground effect hover controllability had been demonstrated to 17 kt wind from all directions. While a limiting figure was not provided for an out of ground effect[4] hover, the pilot advised that a power assurance check conducted prior to commencing the approach confirmed that out of ground effect power existed.

In the video footage of the first approach, (Video 1) taken from the edge of the landing site, the helicopter became unstable in the final stages of the approach, with the nose yawing to the right. The yaw was arrested by the pilot, but sideways drift was evident as the approach continued. Upon terminating into a hover over the landing site, the tail again began yawing from side to side before the pilot conducted a missed approach.

2 Notice to Airmen (NOTAM): A notice distributed by means of telecommunication containing information concerning the establishment, condition or change in any aeronautical facility, service, procedure or hazard, the timely knowledge of which is essential to personnel concerned with flight operations.

3 Ceiling and visibility okay (CAVOK): visibility, cloud and present weather are better than prescribed conditions. For an aerodrome weather report, those conditions are visibility 10 km or more, no significant cloud below 5,000 ft, no cumulonimbus cloud and no other significant weather.

4 Out of ground effect: helicopters require less power to hover when in 'ground effect' then when out of 'ground effect' due to the cushioning effect created by the main rotor downwash striking the ground. The height of 'ground effect' is usually defined as more than one main rotor diameter above the surface.

Video 1: First approach

Source: Witness

The data extracted from the onboard GPS (Figure 2), indicated the track for both approaches was approximately south-east.

Figure 2: Final approach path

The flight track extracted from the helicopter GPS is shown in red. The inset shows the proximity of the obstacles (power lines and palm trees) under the approach to the planned landing area. The relative wind can be seen to be almost perpendicular to the track from the left, an area of known hazard for the onset of LTE.
Source: Google Earth with GPS data, annotated by ATSB

Video footage of the second approach (Video 2) showed that the helicopter approached at approximately 100 ft above ground level before suddenly yawing to the right. The rate of rotation could be seen to accelerate, and the radius of turn tighten as the helicopter rotated through two and a half revolutions. Directional control of the helicopter was not recovered, and the rotational speed of the main rotor blades could be heard to decrease as the helicopter began to descend. The rotating descent continued until the helicopter struck powerlines and then collided with terrain.

Video 2: Accident sequence

Source: Witness

Proposed landing site

The pilot had been in contact with the venue's management and visited the location twice prior to the flight, to confirm the dimensions and the suitability of the carpark as the landing site. Civil Aviation Safety Regulations (CASR) 1998, 91.410 *Use of aerodromes* required that an aircraft take-off or land from

> a place that is suitable... and the aircraft can land at, or take off from the place safely having regard to all the circumstances of the proposed landing or take-off (including the prevailing weather conditions)

The venue was located on a main road in a built-up suburban area (Figure 2). The approach to the carpark was planned to overfly a clearing on the opposite side of the road to the venue before passing over powerlines along the road, and palm trees at the perimeter of the carpark (Figure 3). The helicopter would be required to enter an out of ground effect hover at approximately 50 ft above ground level, before conducting a vertical descent to the ground.

CASA guidance in Advisory Circular AC 91-29 *Guidelines for helicopters – suitable places to take off and land* acknowledges that as a private operation, the safety margins that would otherwise be expected to be applied to performance calculations when conducting commercial operations do not apply.

> There is no legal obligation on helicopter pilots operating solely under Part 91 to apply safety margins to the take-off or landing distance, take-off performance and obstacle avoidance ability which has been determined when using the helicopter manufacturer's data.

Additionally, AC 91-29 detailed when a particular landing site was considered to be a confined area and the obligations of the pilot when selecting the particular landing site.

> An unprepared landing site that has obstructions that require a steeper than normal approach, where the manoeuvring space in the ground cushion is limited, or whenever obstructions force a steeper than normal climb-out angle is often defined as 'Confined Area'. While a pilot can land at a Confined Area, they still have to apply all the basic principles.

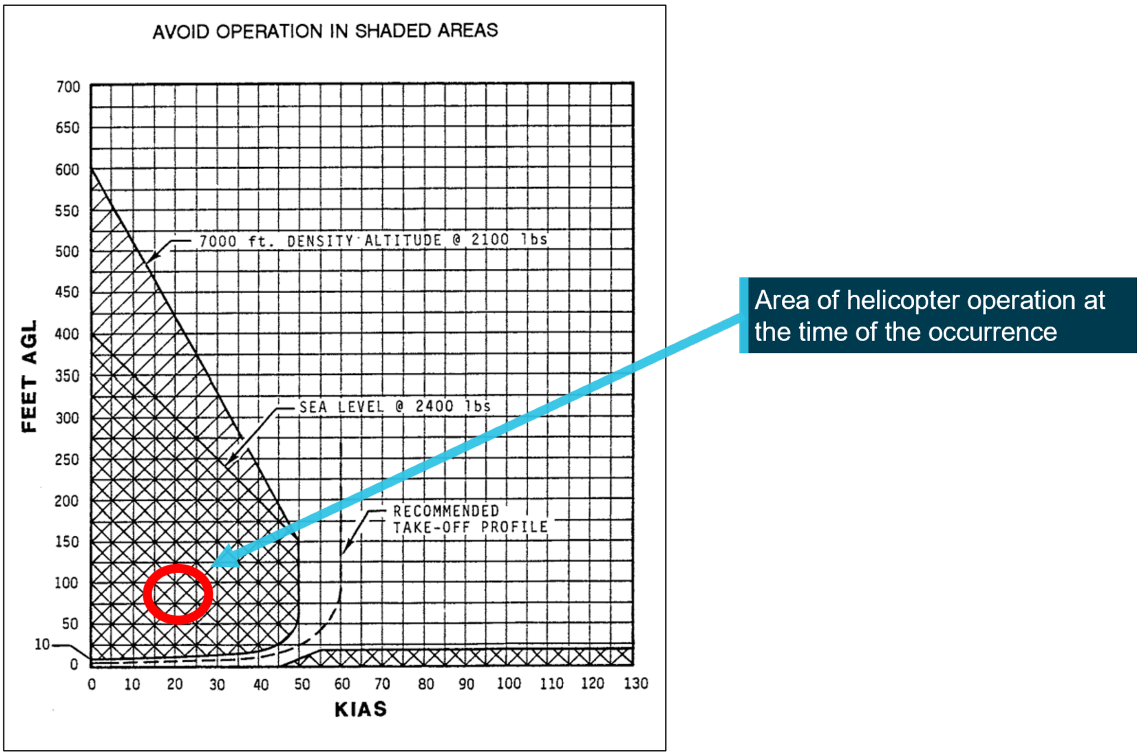
While not having landed at this location before, the pilot had operated into other confined area landing sites on previous flights.

Figure 3: Planned landing site looking in the direction of the approach

Source: ATSB

Where a site is considered to be a confined landing area, CASA guidance in Advisory Circular AC 91-29 *Guidelines for helicopters – suitable places to take off and land* recommended that in addition to aircraft performance, 'the height velocity diagram should also be carefully considered before operating from these areas'. The R44 flight manual included a height-velocity diagram, which defined the conditions from which a safe power-off landing could be made. A notation on the diagram encouraged pilots to avoid operation in the shaded area. The approximate speed and height at which the aircraft was flown during the occurrence with respect to the height-velocity diagram is shown in Figure 4.

Figure 4: R44 height-velocity diagram



Source: Robinson Helicopter Co. R44 Piot operating handbook, annotated by ATSB

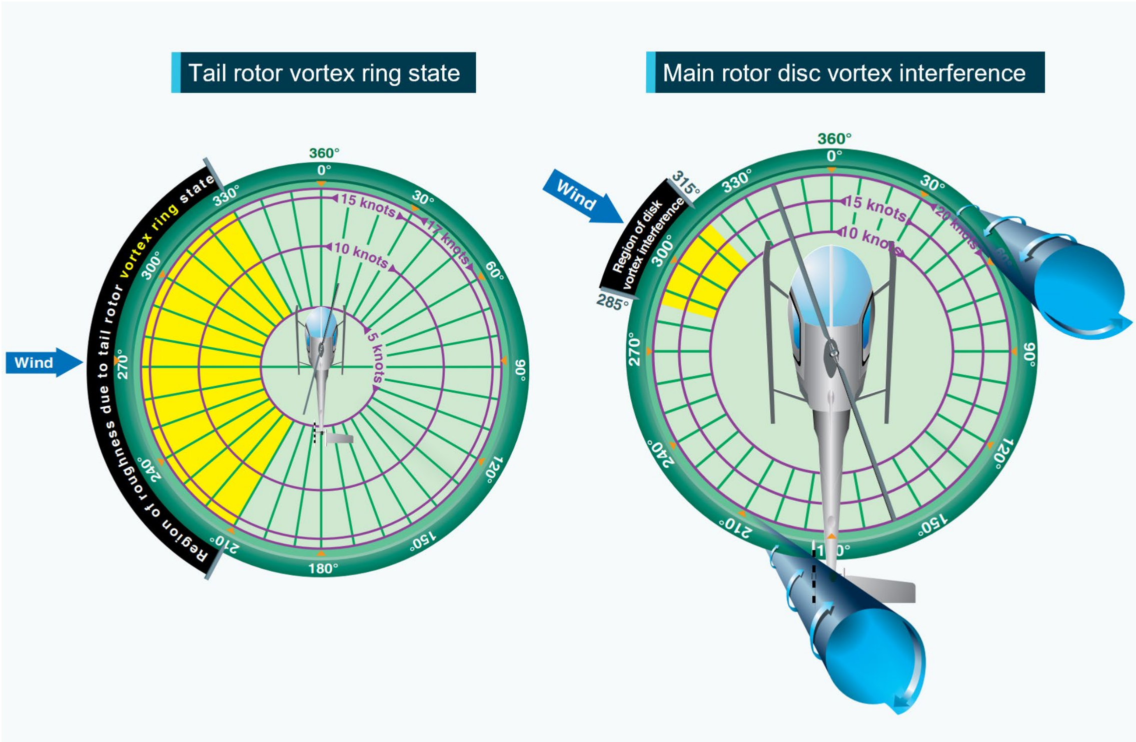
Unanticipated yaw

The FAA Helicopter Flying Handbook *Chapter 11: Helicopter emergencies and hazards* stated that loss of tail rotor effectiveness (LTE) is 'an uncommanded rapid yaw towards the advancing blade'. It 'is an aerodynamic condition and is the result of a control margin deficiency in the tail rotor'. Tail rotor thrust is affected by numerous factors, including relative wind, forward airspeed, power setting and main rotor blade airflow interfering with airflow through the tail rotor.

Several wind directions relative to the nose of the helicopter, shown in Figure 5, are conducive to LTE when single rotor helicopters fitted with counter-clockwise rotating main rotor blades such as the R44, are flown at speeds of less than 30 kt. The wind directions that were of relevance during VH-TKI's approach included the following:

- 210–330°, tail rotor vortex ring state. Turbulent air produced by the tail rotor blade vortices recirculate through the tail rotor leading to the development of unsteady airflow through the tail rotor and fluctuations in tail rotor thrust. The change in thrust means that the airflow around the tail rotor will vary in direction and speed, requiring an increase in rudder pedal workload to maintain directional control. The loss of this tail rotor efficiency increases the power demand and there is an additional antitorque requirement.
- 285–315°, main rotor disc vortex interference. Winds at velocities of 10–30 kt from the left front cause the main rotor blade vortices to enter the tail rotor disc producing turbulent airflow that interferes with the tail rotor. High power settings generate an associated increase in main rotor downwash and blade tip vortices. The turbulent airflow increases the likelihood of main rotor disc vortex interference as illustrated in Figure 5.

Figure 5: Azimuths[5] of concern for loss of tail rotor effectiveness



Source: FAA Helicopter Flying Handbook

The FAA advisory circular AC 90-95 – *Unanticipated Right Yaw in Helicopters* stated that

> Any manoeuvre which requires the pilot to operate in a high-power, low-airspeed environment with a left crosswind or tailwind creates an environment where unanticipated right yaw may occur.

It also provides guidance on how to avoid the onset of LTE and advised pilots to avoid the following flight conditions when operating below 30 kt:

- tailwinds
- out of ground effect hovers and high-power demand situations such as downwind turns
- hovering out of ground effect in winds of about 8–12 kt.

Robinson Helicopter Company safety notice SN-42: *Unanticipated yaw*

The Robinson Helicopter Company advised that to avoid unanticipated yaw, pilots should be aware of conditions that may require large or rapid pedal inputs. They recommend practising slow, steady-rate hovering pedal turns to maintain proficiency in controlling yaw.

Recovery from unanticipated yaw

In addition to providing guidance on how to avoid the sudden onset of unanticipated yaw, AC 90-95 provided the following recovery technique:

- apply full left pedal while simultaneously moving cyclic[6] control forward to increase speed
- if altitude permits, reduce power
- as recovery is affected, adjust controls for normal forward flight.

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5 Azimuth: An azimuth is an angle measured clockwise from the south or north.

6 Cyclic: a primary helicopter flight control that is similar to an aircraft control column. Cyclic input tilts the main rotor disc, varying the attitude of the helicopter and hence the lateral direction.

The pilot stated that the yaw to the right was uncommanded and unexpected. As the rotation began, the pilot applied full left anti-torque pedal input to arrest the rotation and manoeuvred towards a clearing on the opposite side of the road. While maintaining left pedal input, they also applied forward cyclic to increase the helicopter's forward speed. These inputs were consistent with the recovery guidance for unanticipated yaw.

The pilot further advised that they probably raised the collective in an attempt to fly away. As the collective is raised, there is a simultaneous and equal increase in pitch angle of all main rotor blades. An increase in pitch angle also results in increased drag on the main rotor blades. To counter this adverse effect, the R44 has a throttle correlator mechanism attached to the collective control that increases the throttle when the collective is raised.

A condition known as overpitching exists when the collective is raised to a point where the main rotor blade angle of attack creates so much drag that all available engine power cannot maintain or restore normal operation rotor RPM.[7] Beyond this point, any further attempt to raise the collective will result in a reduction of main rotor RPM as the engine has no remaining power margin to overcome the drag on the blades. With a reduction of the main rotor RPM, there will be a reduction in lift being produced and a disproportionate reduction in the amount of anti-torque thrust available to the tail rotor. In explaining the reduction in tail rotor thrust, Robinson stated:

> Since thrust of the rotor is proportional to the square of RPM, and the tail rotor is operating at roughly 6 times the RPM of the main rotor, a small reduction in main rotor RPM leads to a large reduction in tail rotor thrust.

Overpitching can also occur if the pilot raises the collective lever at a rate that is faster than the correlator will open the throttle, while not compensating for the increased drag by manually increasing the throttle.

The pilot was confident that the throttle was set to 100% for the approach, however, they were not certain if the throttle was manipulated in the avoidance manoeuvre. The recommended technique for recovery from unanticipated yaw is to lower the collective to reduce torque and simultaneously increase throttle to over-ride the correlator, which would otherwise decrease the throttle when the collective is lowered.

Maintaining maximum available engine RPM ensures that the maximum power is available to the anti-torque system. During both approaches, the helicopter could be seen to drift with the wind. AC 90-95 advised that drifting with the wind results in a reduction in the effective translational lift[8] and a corresponding increase in the power demand and anti-torque requirements. This again could result in a decrease in the main rotor RPM and the corresponding anti-torque thrust available.

Accident site

The ATSB attended the site and conducted an inspection of the wreckage (Figure 1). The helicopter had struck high and low-voltage power lines during the descent and came to rest on its left side, spanning a drainage culvert.

Inspection of the cockpit showed that there was full left pedal input. While the pedals could not be moved, a subsequent examination found this was due to airframe deformation attributed to the impact. Once adjusted, the pedals moved freely. The drive belts were intact and in place. Once

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[7] International Civil Aviation Organization (ICAO) Manual of Aircraft Accident and Incident Investigation. Chapter 15: Helicopter investigation.

[8] Effective translational lift: Increase in the efficiency of a rotor achieved as it clears its own tip vortices and enters undisturbed air. The increased efficiency of the blade results in an increase in lift with an associated reduction in power demand on the antitorque system.

the clutch was released, the main rotor rotated freely, and drive continuity was followed to the tail rotor.

The tail boom skin was disrupted in 2 locations but was still attached to the helicopter. The fracture surfaces on the drive shaft were consistent with overstress and attributed to the impact with terrain. Similarly, damage to the tail rotor gearbox housing showed evidence of uniform overstress attributed to the impact. A review of witness videos showed no evidence of tail boom disruption in flight and the engine could be heard to operate normally.

The main rotor blades showed evidence of low rotational energy with both blades still intact and connected to the hub. Additionally, no major ground scars were observed on-site. The pilot advised that the low rotor RPM horn sounded at approximately the same time the helicopter struck the powerlines.

The positions of the collective and the throttle were examined during the on-site inspection and the collective was found lowered with the half throttle set. It could not be determined from the onsite inspection what control inputs were applied prior to descent and it is likely that these controls were disrupted following the collision with terrain as the pilot fell in that direction across the controls.

Assessment of damage

No anti-torque, cyclic or collective control faults or other mechanical issues were found with the helicopter. Continuity in the anti-torque system and drive train were consistent with pilot report of no mechanical issues with the helicopter.

Similar occurrence

ATSB investigation AO-2017-054

On 17 May 2017, the pilot of a Robinson Helicopter R44 II, registered VH-MNU, was conducting aerial work at Moreton Island, Queensland with one passenger on board. The pilot departed for a local flight at about 1005 local time. At about 1130, the helicopter was operating at approximately 50 ft above ground level and tracking in a south-westerly direction, at an airspeed of about 10 kt (and groundspeed of about 20 kt), when the pilot commenced a right turn. The pilot felt a loss of tail rotor effectiveness as the helicopter continued to yaw to the right and reported that they were unable to arrest the yaw with left pedal input.

The pilot applied forward cyclic to try to increase the helicopter's forward speed and some right cyclic to try to follow the turn. As the helicopter turned back into wind and rotated through about 110°, the rate of yaw started to increase. The pilot then raised the collective in an attempt to increase the helicopter's height above trees, which further increased the yaw rate due to the increase in torque. The helicopter completed about 2 full rotations and reached about 80 ft above the ground, when the low rotor RPM warning horn sounded. The pilot immediately lowered the collective and the helicopter descended. As the helicopter neared treetop height, the pilot deployed the emergency floats and the pilot raised the collective to cushion the impact. The pilot and passenger sustained minor injuries and the helicopter was substantially damaged.

Safety analysis

The pilot planned to land at a confined area that required them to approach the landing site over powerlines and a row of trees. This required the helicopter to be flown out of ground effect with a high-power setting and at slow forward air speed.

Considering the recorded Gosford weather observations of the wind from the north-east at 10 kt, the approach track placed the wind from a direction and at a speed known to be conducive to the onset of loss of tail rotor effectiveness (LTE) via both tail rotor vortex ring state and main rotor disc vortex interference (Figure 5). The yaw fluctuations experienced during the first approach were consistent with the onset of an unanticipated yaw but were not identified by the pilot.

Video footage of the accident sequence showed a right yaw with accelerating rotation, also consistent with the symptoms of an unanticipated yaw event.

Flying out of ground effect at a slow forward airspeed in proximity to obstacles placed the aircraft in a scenario that did not easily allow for recovery. It is likely that the initial actions by the pilot were consistent with the recommended recovery techniques. However, while setting 100% throttle provided maximum power-on rotor RPM and ensured the maximum anti-torque thrust was available, it would also have maintained the torque inducing the yaw.

Further, consistent with the pilots account of the low rotor RPM horn activation and the audible reduction in main rotor RPM present in the video footage, raising of the collective to avoid obstacles during the attempted recovery, probably over-pitched the main rotor blades. The resulting decrease in both the main and tail rotor speed reduced the available anti-torque thrust and increased the rate of descent.

In a situation where the time to respond is reduced, such as during an approach, following the recommended recovery technique greatly improves the likelihood of recovering controlled flight. However, based on the available height above obstacles and uncertainty around the actual control inputs made by the pilot, it could not be determined if application of the recommended recovery technique would have been effective in recovering the helicopter or if a collision was unavoidable.

The FAA helicopter flying handbook stated that a recovery path must always be planned, especially when terminating to an out of ground effect hover and executed immediately if an uncommanded yaw is evident. Terrain, obstacles, and people in the undershoot limited the available forced landing options to the pilot on this occasion.

Findings

ATSB investigation report findings focus on safety factors (that is, events and conditions that increase risk). Safety factors include ‘contributing factors’ and ‘other factors that increased risk’ (that is, factors that did not meet the definition of a contributing factor for this occurrence but were still considered important to include in the report for the purpose of increasing awareness and enhancing safety). In addition ‘other findings’ may be included to provide important information about topics other than safety factors.

These findings should not be read as apportioning blame or liability to any particular organisation or individual.

From the evidence available, the following findings are made with respect to the loss of control and collision with terrain involving VH-TKI on 15 November 2022.

Contributing factors

- During approach to a confined area landing site, the helicopter experienced unanticipated right yaw, resulting in collision with powerlines and terrain.

Other findings

- It could not be established if control of the aircraft was recoverable from the point in the approach that the unanticipated right yaw occurred.

General details

Occurrence details

Date and time:	19 November 2022 1804 Eastern Daylight-saving Time	
Occurrence class:	Accident	
Occurrence categories:	Loss of control, Wirestrike, Collision with terrain	
Location:	67.1 km 71 degrees from Richmond, New South Wales	
	Latitude: 33° 24.358' S	Longitude: 151° 27.881' E

Aircraft details

Manufacturer and model:	ROBINSON HELICOPTER CO R44	
Registration:	VH-TKI	
Serial number:	40	
Type of operation:	Part 91 General operating and flight rules	
Activity:	General aviation / Recreational-Sport and pleasure flying-Pleasure and personal transport	
Departure:	Jilliby, New South Wales	
Destination:	Forresters Beach, New South Wales	
Persons on board:	Crew – 1	Passengers – 2
Injuries:	Crew – 1 minor	Passengers – 2 minor
Aircraft damage:	Substantial	

Sources and submissions

Sources of information

The sources of information during the investigation included the:

- pilot of the accident flight
- chief pilot of Skyline Aviation
- Bureau of meteorology
- Robinson Helicopter Co. R44 Pilot Operating Handbook
- accident witnesses
- video footage of the accident flight
- recorded data from the GPS unit in VH-TKI.

References

Civil Aviation Safety Authority. (2022). *Advisory Circular AC 91-29 v1.1 Guidance for helicopters – suitable places to take-off and land.* Civil Aviation Safety Authority.

Civil Aviation Safety Authority. (2019). Civil Aviation Safety Regulations 1998 - *Part 91 (General operating and flight rules)* Australian Government.

International Civil Aviation Organization. (2011). *Manual of Aircraft Accident and Incident Investigation Part III: Investigation*, Doc 9756, ICAO, Montréal.

Federal Aviation Administration. (1995). *Advisory Circular AC 90-95 – Unanticipated right yaw in helicopters.* Federal Aviation Administration.

Federal Aviation Administration. (2019). *Helicopter flying handbook.* U.S Department of Transportation.

Robinson Helicopter Company. (2021). *R44 Pilot's Operating Handbook*. Robinson Helicopter Company.

Robinson Helicopter Company. (2021). Safety Notice SN-42 – *Unanticipated yaw*. Robinson Helicopter Company.

Submissions

Under section 26 of the *Transport Safety Investigation Act 2003*, the ATSB may provide a draft report, on a confidential basis, to any person whom the ATSB considers appropriate. That section allows a person receiving a draft report to make submissions to the ATSB about the draft report.

A draft of this report was provided to the following directly involved parties:

- the pilot of the accident flight
- the chief pilot of Skyline Aviation
- Robinson Helicopter Company
- United States National Transportation Safety Board.

Submissions were received from:

- the chief pilot of Skyline Aviation
- Robinson Helicopter Company

The submissions were reviewed and, where considered appropriate, the text of the report was amended accordingly.

Australian Transport Safety Bureau

About the ATSB

The ATSB is an independent Commonwealth Government statutory agency. It is governed by a Commission and is entirely separate from transport regulators, policy makers and service providers.

The ATSB's purpose is to improve the safety of, and public confidence in, aviation, rail and marine transport through:

- independent investigation of transport accidents and other safety occurrences
- safety data recording, analysis and research
- fostering safety awareness, knowledge and action.

The ATSB is responsible for investigating accidents and other transport safety matters involving civil aviation, marine and rail operations in Australia, as well as participating in overseas investigations involving Australian-registered aircraft and ships. It prioritises investigations that have the potential to deliver the greatest public benefit through improvements to transport safety.

The ATSB performs its functions in accordance with the provisions of the *Transport Safety Investigation Act 2003* and Regulations and, where applicable, international agreements.

Purpose of safety investigations

The objective of a safety investigation is to enhance transport safety. This is done through:

- identifying safety issues and facilitating safety action to address those issues
- providing information about occurrences and their associated safety factors to facilitate learning within the transport industry.

It is not a function of the ATSB to apportion blame or provide a means for determining liability. At the same time, an investigation report must include factual material of sufficient weight to support the analysis and findings. At all times the ATSB endeavours to balance the use of material that could imply adverse comment with the need to properly explain what happened, and why, in a fair and unbiased manner. The ATSB does not investigate for the purpose of taking administrative, regulatory or criminal action.

Terminology

An explanation of terminology used in ATSB investigation reports is available on the ATSB website. This includes terms such as occurrence, contributing factor, other factor that increased risk, and safety issue.